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Operating and Safety Instructions

Product Safety

Every effort has been made to ensure this product has been designed with safety in mind.

Components used within this product are used within the manufacturers stated specification limits. Under no circumstances should replacement parts other than those specified or supplied by the manufacturer be used within this machine.

Electrical Safety

This machine must not be used unless it is correctly earthed and should be connected to a mains supply of 220v/240v at a frequency of 50Hz.

All machines leaving the manufacturer are subject to electrical safety tests. These tests consist of earth-bond and insulation tests. These tests should be carried out on a regular basis, or when a critical part is replaced.

Only suitably qualified or adequately instructed person should carry out work on the internal parts of this machine.

Connection.

A three-pin plug fitted with a fuse rated at 3 Amps should be fitted to the supply cable. The supply cable should not exceed a length of 2 metres.

Parts list

Final Frontier is designed to fit the list of Barcrest Roll Top base machines on the front cover.

If the kit is to be fitted on a machine other than the ones stated then additional parts may be required depending on the base machine.

On receipt of your kit please check the content against the following list, and notify our **Spares Department** *immediately* of any shortages on 01222 377402.

Part	Part number
Top Glass	AT 1006
Reel Glass	AL 1006
Reel Band 1	AR 1022
Reel Band 2	AR 1023
Reel Band 3	AR 1024
Button Legends x 8	AB 1006
£5 Cash disclaimer	AD 1078
£8 cash disclaimer	AD 1079
£15 cash disclaimer	AD 1121
£5 + repeat chance Jackpot	AD 1081
£5 Jackpot	AD 1082
£8 Jackpot	AD 1083
£15 Jackpot decal	AD 1119
5p Price of play	AD 1065
10p Price of play	AD 1086
20p Price of play	AD 1087
25p Price of play	AD 1088
30p Price of play	AD 1120
5p/10p right hand side decal ALL JACKPOTS	AD 1089
20/25p Right hand side decal £5/£8	AD 1090
20/25p Right hand side decal £15	AD 1091
5/10p Left hand side decal ALL JACKPOTS	AD 1092
20/25p Left hand side decal £5/£8	AD 1093
20/25/30p Left hand side £15	AD 1094
3 x RPB assembly complete	
Top Vacuum Form loomed	
Reel glass vacuum form loomed	
Alphanumerical display bracket incl. 2 x 3BA nuts & bolts	
Game manual	
Back door sticker	

Final Frontier Game Information

General

Final Frontier is a 3-reel AWP machine for the UK single site / arcade market.

Game Description

Nudges are available by adding numbers to a 17stage trail (the last 10 positions giving between 1 and 10 nudges). Position 4 on this trail will award one of the following bonus features: -

Advance- will advance up the trail with the chance of awarding nudges.

Selector- will allow the player to select a trail position within a given time limit.

Respin- will respin all reels (player may hold any reels if quick enough).

Skill- will allow the player to skill-stop up to a random number of nudges.

Spotter- will award a position on the trail beyond the bonus position.

A question mark on the centre reel will award a random advance up the trail (if below the bonus position this will always advance to the bonus position).

When nudges are achieved, any numbers or the question mark nudged onto the win-line will advance up the trail increasing the chance of a better win.

Any three characters on the win-line will award the main feature and start at the bottom of the Phasor feature column. If three matching characters are on the win-line the player will be awarded the appropriate feature level with a bonus.

All wins may be gambled on the high/low panel up to the jackpot. After a successful gamble the player may exchange for the main feature.

The Feature

The main feature is split into three circular trails, with 3 associated feature columns (Phasor, Plasma and Photon). At any time the player may collect the top position of the active feature column or use any weapons to allow access to any features in the active feature column. The player may also choose to gamble for a higher win by going around the current trail, this could result in advancing up the current feature column, awarding extra weapons, advancing to an inner level or landing on a temporal rift square as follows: -

Repeat Chance- awards a repeat chance of the feature in the next game.

Boost- advances around the current feature level.

A power Up- award extra weapons, and advances up the current feature column.

Enemy Attack- the player has a possible chance of staying in the game.

Spotter - allows the player to stop at a random position on the current level.

Transport- transports the player in 1 level.

Core breach- causes the player to lose all wins and ends the feature.

Space walk- gives the player a skill stop on the number panel, allowing him to select where he will land.

If the player succeeds in getting to the centre of the board the reactor cash jackpot is awarded.

Conversion instructions.

Prior to commencement ensure that the machine to be converted is in good working order.

- 1) Disconnect and remove the coin handling.
- 2) Disconnect and remove the reel unit.
- 3) Disconnect the lamp looms attached to the lamp interface board.
- 4) Remove the button switches from the button housings.
- 5) Remove the alphanumeric display.
- 6) Remove the securing screws fixing the glass frames, from the machine.
- 7) Place the frames onto a flat surface and remove the glasses, retain all fixings to use again, discard the glasses.
- 8) Before replacing the new glass into the framework affix the vacuum forming to the glass ensuring that it is aligned correctly. Replace glasses into the frame and secure back into the machine the same way they came out.
- 9) Remove the lens caps from the buttons and discard the existing button legends. Replace with legends provided. See figure 1 in the Technical Data section of the manual.
- 10) Reconnect button switches to the button housings.
- 11) Reconnect the lamp looms to the interface board and auxiliary board. See figure 4 in the Technical Data section of the manual.
- 12) The three circular buttons are then fitted into the top glass. See figure 2 in the Technical Data section of the manual.
- 13) Connect the feature switches. The white wires are for the switch. The green and blue wires are fitted to the lamp terminals. Connect the trailing loom to a connector provided in the original machine loom. The location of this is usually in the top right hand side of the machine and has black, green, and blue wires fitted.
- 14) Fit the alphanumeric display on to the central extrusion with the bracket provided.
- 15) Fit the Sound EPROM's and the game EPROM into the program card and adjust selector links (if necessary). See figure 3.

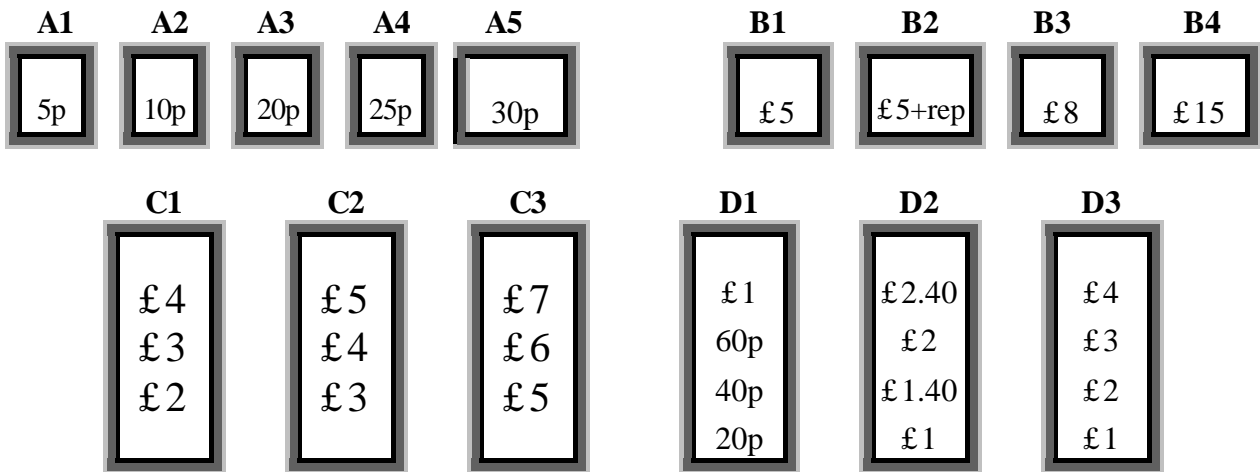
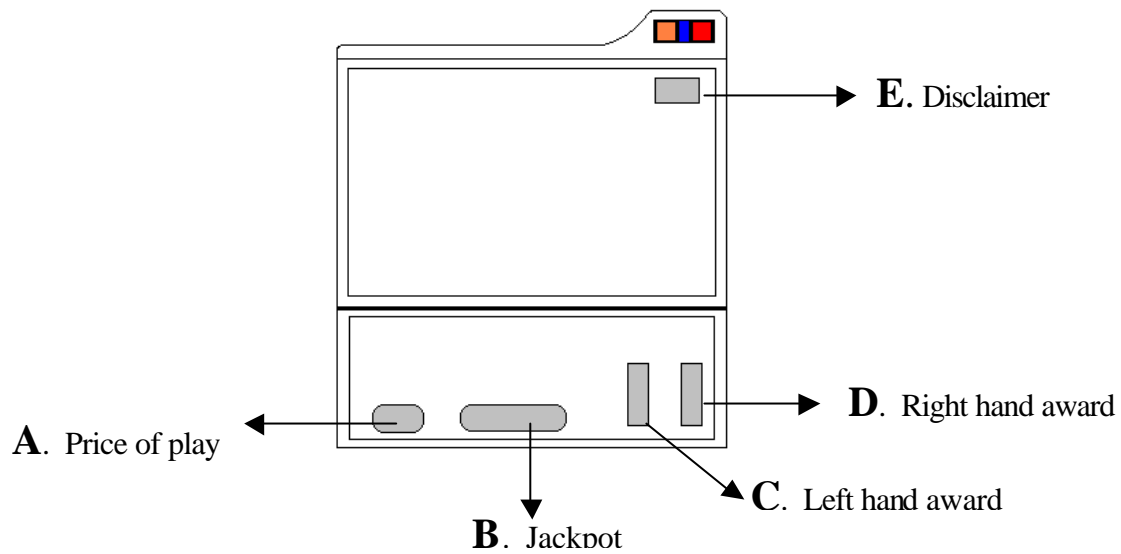
Setting-up

No connector or component must be removed or reconnected whilst the power is turned on.

Check that all connectors, assemblies, and wiring harness are correctly engaged inside the machine.

Set the DIL switch options on the MPU board to the desired position and fit the relevant decals. Run the machine through the test procedure.

Award Structure



For the correct decal layout relevant to the stake and prize please refer to the table below.

Stake and prize	Decals to be fitted
5p £5	A1, B1, C1, D1
5p £8cash/ token	A1, B3, C1, D1
5p £15	A1, B4, C1, D1
10p £5	A2, B1, C1, D1
10p £8 cash / token	A2, B3, C1, D1
10p £15	A2, B4, C1, D1
20p £5	A3, B2, C2, D2
20p £8 cash / token	A3, B3, C2, D2
20p £15	A3, B4, C3, D3
25p £5	A4, B2, C2, D2
25p £8 cash / token	A4, B3, C2, D2
25p £15	A4, B4, C3, D3
30p £15	A5, B5, C3, D3

Switch Settings

Switch bank 1

Switch	OFF	ON
1	Ram clear toggle	Ram Clear toggle
2	Enable coin alarm	Coin Alarm Inhibit
3	Wins banked	Direct Payout
4	Low token ratio	High token ratio
5	Payout if tubes low	Lock up if tubes low
6	Small motors	Large motors
7	Not used (leave OFF)	
8	Multi-coin play	Single coin play

Switch bank 2

Switch	Function
1	Stake & Prize selection (see overleaf)
2	Stake & Prize selection (see overleaf)
3	Stake & Prize selection (see overleaf)
4	Stake & Prize selection (see overleaf)
5	Payout percentage selection (see overleaf)
6	Payout percentage selection (see overleaf)
7	Payout percentage selection (see overleaf)
8	Payout percentage selection (see overleaf)

NOTE

Switch 6 on switch bank 1 controls motor selection. When the switch is in the OFF position the Saia, Airpax motors can be used. When the switch is in the ON position the Barcrest, Minebea, Crouzet motors are selected.

Stake, Prize and Percentage Settings.

Switch 1	Switch 2	Switch 3	Switch 4	Outcome
OFF	OFF	OFF	OFF	5p £ 5
ON	OFF	OFF	OFF	5p £ 8cash
OFF	ON	OFF	OFF	5p £ 8token
ON	ON	OFF	OFF	5p £ 15
OFF	OFF	ON	OFF	10p £ 5
ON	OFF	ON	OFF	10p £ 8 cash
OFF	ON	ON	OFF	10p £ 8 token
ON	ON	ON	OFF	10p £ 15
OFF	OFF	OFF	ON	20p £ 5
ON	OFF	OFF	ON	20p £ 8 cash
OFF	ON	OFF	ON	20p £ 8 token
ON	ON	OFF	ON	20p £ 15
OFF	OFF	ON	ON	25p £ 15
ON	OFF	ON	ON	30p £ 15

The percentage can be selected via the DIL switches. If a percentage key is fitted this will override the DIL switch selection. If all the switches are off then the percentage defaults to 78%.

Switch 5	Switch 6	Switch 7	Switch 8	%
ON	OFF	OFF	OFF	70
OFF	ON	OFF	OFF	72
ON	ON	OFF	OFF	74
OFF	OFF	ON	OFF	76
ON	OFF	ON	OFF	78
OFF	ON	ON	OFF	80
ON	ON	ON	OFF	82
OFF	OFF	OFF	ON	84
ON	OFF	OFF	ON	86
OFF	ON	OFF	ON	88
ON	ON	OFF	ON	90
OFF	OFF	ON	ON	92
ON	OFF	ON	ON	94
OFF	ON	ON	ON	96
ON	ON	ON	ON	98

Demonstration mode

A demonstration mode is provided which enables the game to be played or tested without having the need to insert coins and without any actual payout of prizes.

To enter the demonstration mode, open the back door and press the test button once. To achieve £5 worth of credits press the Start button. By holding down the Cancel button and any of the Hold buttons the reels can be stepped down. The reel can also be stepped up by holding down the Cancel and HI buttons, to induce reel wins or to play the feature.

If the MPU does not recognise any activity after approximately 20 seconds the machine enters the attract mode. Credits can then be achieved by pressing the Start button again.

Test Routine.

To enter the test routine the back door must be open and the test-button pressed twice.

The test routine will start on the Coin test. To step to the next test press the third Hold button. To step to a previous test press the first Hold button. The relevant test will be displayed on the alphanumerical display. To activate the desired test the Start button is then pressed. Pressing the Cancel button once escapes that test. If the Cancel button is pressed twice the machine enters the demonstration mode.

<u>Test Number</u>	<u>Test procedure</u>
1	Coin handling
2	Reel test
3	Lamps test
4	Switch test
5	Display test
6	Meter test
7	RS232
8	Sound test
9	Percentage test
10	Alarm log

Test 1 – Coins

When a coin is accepted the relevant amount will display on the alphanumeric.

The Exchange button will flash and when pressed will inhibit all coins. When pressed again the coins will then be enabled.

The solenoids can then be pulsed when the relevant hold buttons are pressed. If the button is held down for three seconds the solenoid will pulse until the button is released.

1st Hold button will pulse the 20p solenoid.

2nd Hold button will pulse the pound solenoid.

3rd Hold button will pulse the front token tube.

HI button will pulse the rear token tube.

The level sensors can also be tested in this test. The £1 level sensor when active (tube full) will light the number 1 and when engaged and a voice saying, “Pound” will sound.

The 20p level sensor when active will light the number 2 when engaged, and a voice saying “20p Low” will sound.

The front token tube (tube 1) level sensor will light the number 3 when engaged, and a voice saying “token low” will sound.

The rear token tube (tube2) will light number 3 and a voice saying “token low” will sound.

Test 2 – Reel test

On pressing the Start button, the reels will spin and settle with the first symbol of the reel band on the win line. The appropriate win value will be displayed on the alphanumeric display and the appropriate award will illuminate on the glass.

The reels can be stepped down by holding the relevant button.

Pressing the Take Win button will allow the win to be paid out.

To exit this test no win must be present on the win line and the Cancel button pressed.

Test 3 – Lamp test

On pressing the Start button all buttons will illuminate. Each press of the Start button will illuminate the next group.

- Group 1-* Buttons
- Group 2-* Reels
- Group 3-* Reel glass
- Group 4-* Top glass

Pressing the first Hold button will flash all lamps. To exit all lamps flash, press the Hold button again.

To enter the step lamp test, press the Exchange button once. This will step through the lamps in the current group. Whilst in step lamp test pressing the third Hold/Nudge button will enable the step lamp test to be stepped manually. Pressing the Exchange button again will stop the step lamp test.

Test 4 - Switch test.

On the press of each button, its corresponding lamp will illuminate, a tone will sound and the relevant information displayed on the alphanumeric display.

The DIL switches on the MPU will light the relevant position on the top glass if in the on position. The information is also displayed on the alphanumeric display. For example if DIL bank 2, switch 3 is turned on then the alphanumeric will display "DIL Switch 2 – 3".

DIL switches 1 to 8 on bank 1 will illuminate rocket positions 1 to 7 and 1 nudge.

DIL switches 1 to 8 on bank 2 will illuminate 2 nudges to 9 nudges.

The test switch will illuminate Reactor cash.

With the refill key turned the LOSE will illuminate.

The £1 level sensor when active (tube full) will light the number 1 and when engaged and a voice saying, "Pound" will sound.

The 20p level sensor when active will light the number 2 when engaged, and a voice saying "20p Low" will sound.

The front token tube (tube 1) level sensor will light the number 3 when engaged, and a voice saying "token low" will sound.

The rear token tube (tube2) will light number 3 and a voice saying "token low" will sound.

To exit this test, press the Start and Cancel buttons simultaneously.

Test 5 – Display.

On pressing the Start button each segment of the alphanumeric will light from left to right then dim. This test when finished will automatically advance to test 6.

Test 6 – Meters.

With the Refill key turned and the Start button pressed, each meter will pulse five times in the following order: - Cash in, Cash out, Token in, Token out, Token refill.

All the meters operate in 10p units.

Once all meters have been pulsed the machine will automatically advance to test 7.

Test 7 – RS232.

If the RS232 Data port is not present the alpha will display FAIL.

This test will automatically advance to test 8.

Test 8 – Sounds.

On pressing the Start button the sample number will be listed on the alphanumeric display. To activate the sample press Start.

To increment the sample number use the third Hold/Nudge button, to decrease use the first Hold button. On pressing the Exchange button the machine will automatically play each tune.

If the volume is too quiet it can be adjusted with the doors closed the refill key turned and the Start button then pressed. This adjustment is only available on the program card # B83077. On other cards the volume is adjusted via a potential resistor on the program card.

Test 9 – Percentage.

On pressing the Start button the aiming and the actual percentage will be displayed on the alphanumeric display.

Press Cancel to exit.

Test 10 – Alarms.

On pressing the Start button the alarm log number will be shown on the left-hand side of the display, the alarm code on the right.

By pressing the third Hold/Nudge and the first Hold/Nudge buttons you can increment or decrement the log number respectively.

By depressing the Exchange button for five seconds the alarm log can be cleared.

Alarm codes

Code	Fault	Causes (in order of probability)
0.1	Ram clear/checksum failure	Faulty battery, change of program, M.P.U
0.2	Mode change	Price of play or jackpot change
0.3	Manual ram clear	DIL switch1 bank 1 activated
1.1	£ 1 coin input	Coin jam. Coin mech., coin loom,
1.2	50p coin input	As above
1.3	20p coin input	As above
1.4	10p coin input	As above
1.5	Token input	As above
1.6	5p coin input	As above
1.9	Anti-strim alarm	Coin mech., coin loom, M.P.U
2.1	Reel 1 fault	Set-up, opto, loom, motor, M.P.U
2.2	Reel 2 fault	As above
2.3	Reel 3 fault	As above
7.1	E.D.C failure	Dataport unit not fitted, M.P.U, no -12v
9.1	Incorrect switch settings	Adjust switch settings, faulty MPU
9.2 – 9.4	Faulty processor	Faulty MPU, programme card

Technical Data

Machine Description

Cabinet

Cabinet name: Roll Top
Manufacturer: Barcrest
Technology: MPU4
Height: 1700mm
Width: 690mm
Depth: 650mm
Weight: 120Kg (approx.)

Coin Handling

This machine uses an 18 way routing plug. The pins are identified with the notch of the routing plug facing downward and the wire links facing you.

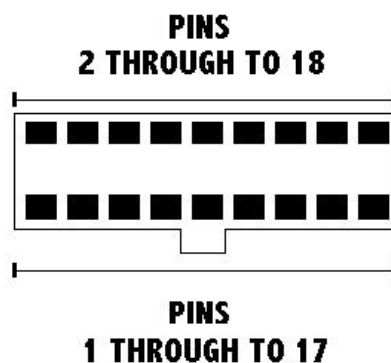
To achieve the correct routing, link pins: -

1 + 2, 4 + 6, 7 + 18, 8 + 15, 12 + 13

1 x 20p Coin Controls compact 50v AC. Fitted with cream Starpoint level sensor.

1 x £1 Coin Controls compact 50v AC. Tube is fitted with red Starpoint 3CLD AA level sensor.

2 x 20p Token Coin Controls compact 50vAC fitted with cream or grey Starpoint 3CLD AA level sensors.



Coin Tube Capacities

The coin tube capacities are listed below with the level sensor positions.

Coin Tube	Capacity	Sensor
20p	£ 30	£ 4.40
£ 1	£ 70	£ 16
20p token front (1)	£ 40	£ 9
20p token rear (2)	£ 30	£ 5

Meters

4 x 12v DC
1 x 48v AC

Software Meters (electronic)

In all there are 50 meters, but there are useful meters that have been incorporated for the operators benefit. These are Cash in, Cash out, Games played, and Cash refilled. For the desired meter refer to the table below.

To access the software meters open the back door and press the test button once. The machine will go into demonstration mode. Next turn the refill key to the on position.

The alphanumerical display will show meter number 0. To display the next meter press the third **Hold/Nudge** button, to display the previous meter press the first **Hold** button.

To clear the meters, press and hold the **Start** button. A countdown sequence will be initiated and can be aborted by releasing the **Start** button. Once the countdown reaches zero the meters will be cleared.

Meter No.	Description	Divide by

Note that the software will be cleared down every time the RAM has been reset and the percentage or price of play has been altered.

Reels

Motor alignment

Put the machine into reel test (test 2). This will spin the reels showing the first symbols on the reel band in the win line.

A pointer moulded into the reel drum should line up with a pointer on the side of the frame. Any miss-alignment can be adjusted by slackening off the motor mounting screws and rotating the motor.

Reel Band Placement

Place the notched reel band on to the notch on the reel drum and rotate. When fully rotated remove the double-sided tape on the bottom edge of the reel band and affix to the top edge of the reel band.

Reel band Layout

Reel 1	Reel 2	Reel 3
MDM Jackpot Cherry Lemon+2	MDM Jackpot Cherry+1 Lemon	MDM Jackpot Cherry Lemon+1

Button Layout

Figure 1 8-way button panel

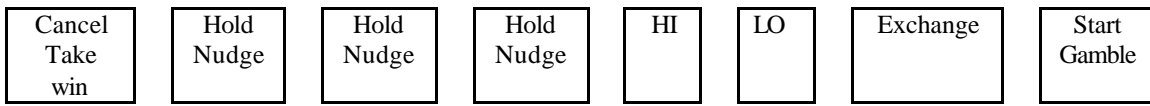
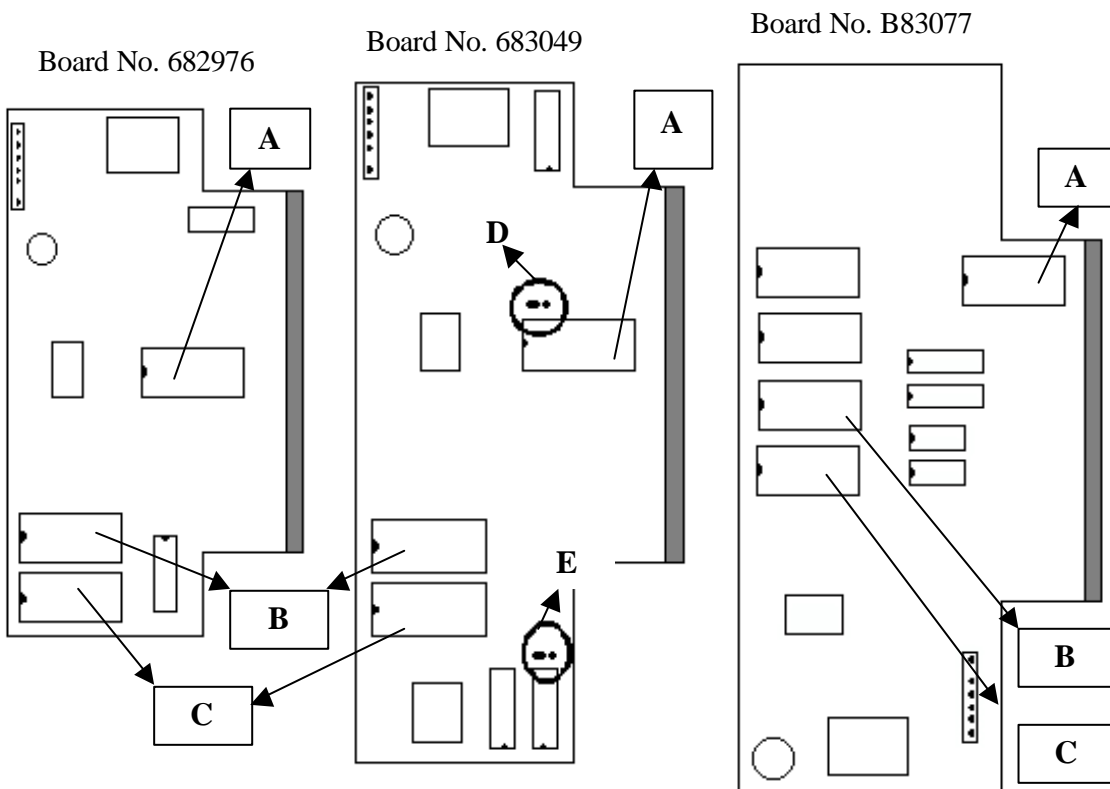


Figure 2 Round push button



Figure 3 Program Cards

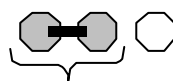


A = Game EPROM

B = Sound EPROM 2

C = Sound EPROM 1

D+E = Link settings.



Link

Connections

Depending on the base machine there are two different types of auxiliary lamp driver boards.

If you have board #. 682996 then only the green auxiliary loom is connected to this board. The blue auxiliary loom is connected to the lamp interface board.

If you have board #. 683031 fitted then the blue and the green auxiliary connectors are fitted to the auxiliary lamp board.

Figure 4 Lamp interface board.

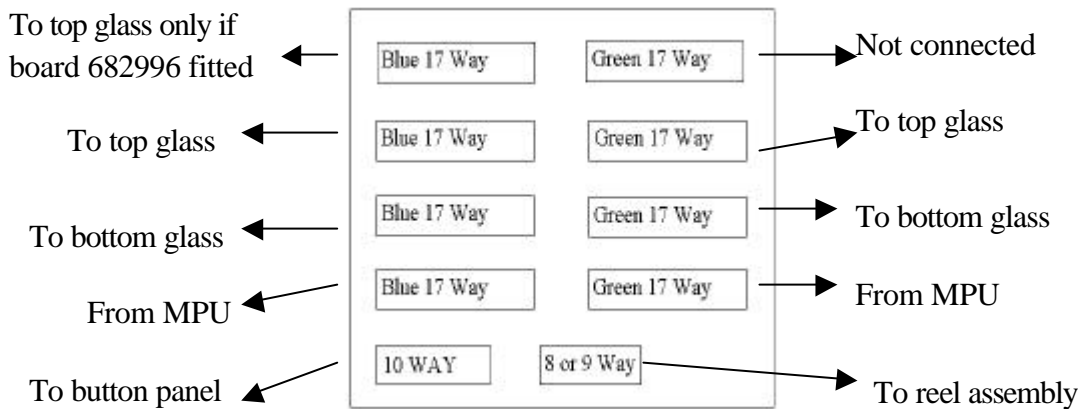
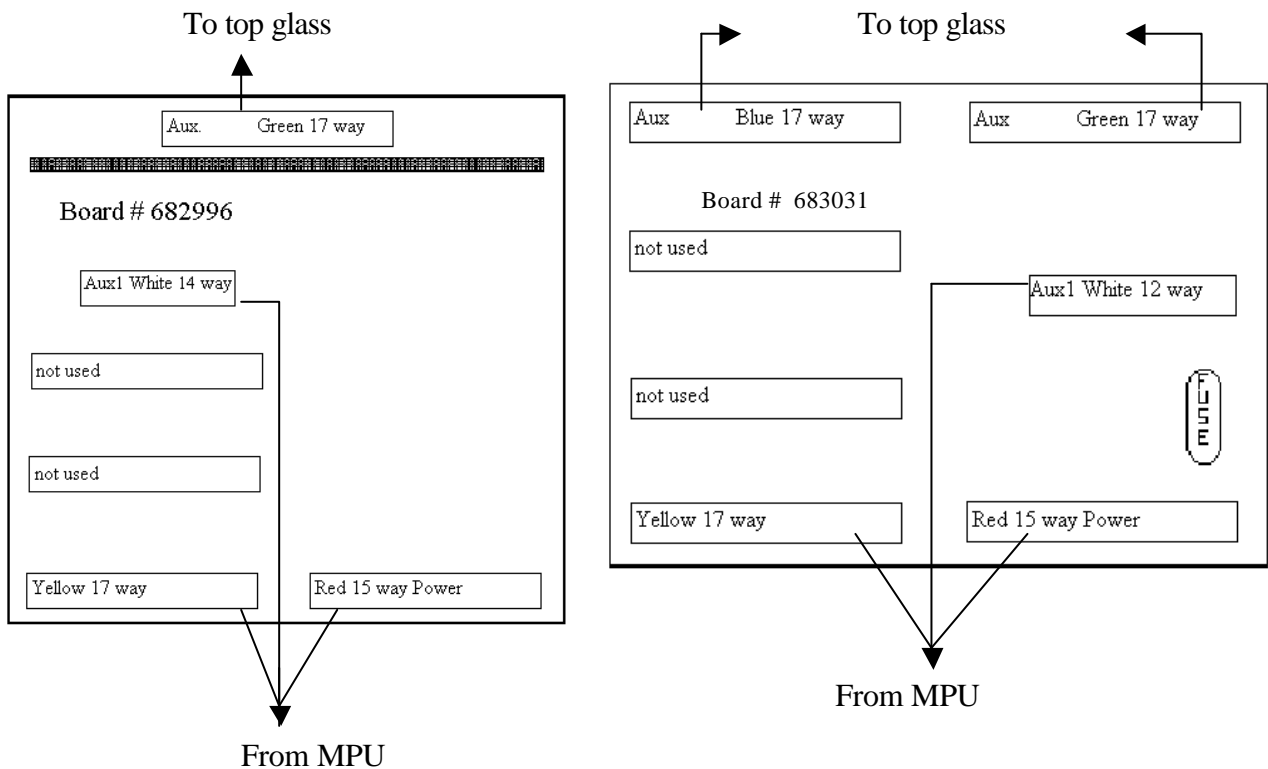


Figure 5 Auxiliary lamp boards.



Lamp Allocation

Lamp	Blue Pin	Green Pin	Position	Group
0	9	1	Reel 1 Top	2
1		2	Reel 2 Top	
2		3	Reel 3 Top	3
3		4	MDM Winner	
4		5	Skill	
5		6	Selector	
6		8	Trail 4 Bonus	
8	8	1	Reel 1 Middle	2
9		2	Reel 2 Middle	
10		3	Reel 3 Middle	
11		4	Spotter	3
12		5	Respin	
13		6	Advance	
14		8	Jackpot award 4	
15		9	Trail 3	
16	7	1	Reel 1 Bottom	2
17		2	Reel 2 Bottom	
18		3	Reel 3 Bottom	
19		4	Cherry award 3	3
20		5	Lemon award 3	
21		6	Plum award 1	
22		8	Orange award 3	
23		9	Trail 2	
24	5	0	Cancel button	1
25		1	1 st Hold/Nudge	
26		2	2 nd Hold/Nudge	3
27		3	Cherry award 2	
28		4	Lemon award 2	
29		5	Plum award 2	
30		8	Orange award 2	
31		9	Lose	
32		4	0	
33	1		HI button	
34	2		LO button	3
35	3		Cherry award 1	
36	4		Lemon award 1	
37	5		Plum award 1	
38	6		Orange award 1	
39	8		Trail 1	
40	3	1	Exchange for feature	1
41		2	Start	
43		4	Grape award 3	3
44		5	Bell award 3	
45		6	Melon award 3	
46		8	Jackpot award 3	
48	2	1	Spock fire button	1
49		2	Kirk fire button	
50		3	Scotty fire button	3
51		4	Grape award 2	
52		5	Bell award 2	
53		6	Melon award 2	
54		8	Jackpot award 2	

Lamp allocation

Lamp	Blue pin	Green pin	Position	Group
56	1	1	Token entry bezel	
57		2	Cash entry bezel	
59		4	Grape award 1	
60		5	Bell award 1	
61		6	Melon award 1	
62		8	Jackpot award 1	
63		9	Trail held	
64		17	10	
65	11		Phasor fire 1	
66	12		Phasor fire 2	
67	13		Phasor fire 3	
68	14		Phasor fire 4	
69	15		Phasor fire 5	
70	16		Phasor fire 6	
71	17		Phasor cherry	
72	16	10	Kirk	
73		11	Photon fire 1	
74		12	Photon 2	
75		13	Photon 2	
76		14	Photon 3	
77		15	Photon 4	
78		16	Photon fire 6	
79		17	Photon Grapes	
80	15	10	Spock	
81		11	Plasma fire 1	
82		12	Plasma fire 2	
83		13	Plasma fire 3	
84		14	Plasma fire 4	
85		15	Plasma fire 5	
86		16	Plasma fire 6	
87		17	Plasma orange	
88	14	10	Number 1	
89		11	Phasor beam me up	
90		12	Phasor 3 nudges	
91		13	Phasor autopilot	
92		14	Phasor 2 steps	
93		15	Phasor cash	
94		16	Phasor orange	
95		17	T.T	
96	13	10	Number 2	
97		11	Photon shuttle launch	
98		12	Photon 9 nudges	
99		13	Photon always forward	
100		14	Photon 4 steps	
101		15	Photon cash	
102		16	Photon jackpot	
103		17	Name lamp 4	
104	12	10	Number 3	
105		11	Plasma replicator	
106		12	Plasma 6 nudges	
107		13	Plasma asteroid belt	
108		14	Plasma 3 steps	
109		15	Plasma cash	
110		16	Plasma grapes	
111		17	Name lamp	

Lamp allocation

Lamp	Blue pin	Green pin	Position	Group
112	11	10	Number 4	4
113		11	Transport	
114		12	Space walk	
115		13	Phasor level 11 rift	
116		14	Phasor level 10 weapon	
117		15	Phasor level 9 crystal	
118		16	Phasor level 8 rift	
119		17	Name lamp 2	
120		10	10	
121	11		Rift spotter	
122	12		Core breach	
123	13		Phasor level 12 space walk	
124	14		Plasma level 10 transporter	
125	15		Plasma level 9 rift	
126	16		Plasma level 8 space walk	
127	17		Plasma level 7 weapon	

Auxiliary Lamp Allocations

Lamp	Blue Pin	Green Pin	Position	Group
129	9	11	Plasma level 11 crystal	4
144	7	10	Photon level 8 crystal	
160	4	10	Photon level 1 Transported	
168	3	10	Plasma level 3 rift	
169		11	Photon level 2 weapon	
176	2	10	Plasma Level 1 transported	
177		11	Plasma level 12 rift	
184	1	10	Phasor level 2 transporter	
185		11	Phasor level crystal	
193	9	2	Trail 10 nudges	
194		3	Phasor level 7 weapon	
195		4	Plasma level 6 crystal	
196		5	Name lamp 1	
197		6	Photon level 7 weapon	
200	8	1	Trail 9 nudges	
203		4	Phasor level 4 space walk	
208	7	1	Trail 7 nudges	
209		2	Trail 8 nudges	
210		3	Phasor level 6 crystal	
211		4	Plasma level 5 rift	
212		5	Photon level 6 space walk	
213		6	Reactor cash	
216	5	1	Trail 5 nudges	
217		2	Trail 6 nudges	
224	4	1	Trail 3 nudges	
225		2	Trail 4 nudges	
226		3	Phasor level 5 rift	
227		4	Plasma level 4 weapon	
228		5	Photon level 5 transporter	
229		6	Reactor cash 2	
232	3	1	Trail 1 nudges	
233		2	Trail 2 nudges	
234		3	Repeat chance	
235		4	Boost	
236		5	Plasma level 3 crystal	
237		6	Photon level 4 crystal	
240	2	1	Trail 6	
241		2	Trail 7	
242		3	Power up	
243		4	Enemy attack	
244		5	Phasor level 3 weapon	
245		6	Plasma level 2 space walk	
248	1	1	Trail 5	
249		2	Number 10	
250		3	Number 9	
251		4	Number 8	
252		5	Number 7	
253		6	Number 6	

MPU Connections

11 Way White – Triac Drives	
Pin	Function
1	48v AC
2	0v
3	20p Solenoid
4	£1 solenoid
5	Token solenoid A
6	Token Solenoid B
7	KEY
8	Not used
9	Not used
10	Cash refill meter (if fitted)
11	Token Refill meter

11 Way Blue – Power Out	
Pin	Function
1	48v AC
2	0v
3	Audio output
4	0v
5	0v
6	0v
7	+12v DC supply
8	Key
9	-12v DC supply
10	+34v DC supply
11	Aerial

19 Way Orange-switches	
Pin No	Function
1	20p level
2	£1 level
3	Token level A
4	Token level B
5	Not used
6	Not used
7	Not used
8	Not used
9	Not used
10	Not used
11	Not used
12	Not used
13	% key pin 4
14	Key
15	% key pin 3
16	% key pin 2
17	% Key pin 1
18	Enable pins 1-8
19	Enable pins 9-17

19 Way Black-Switches	
Pin No	Function
1	Not used
2	Not used
3	Not used
4	Not used
5	Not used
6	Test switch
7	Refill key switch
8	Door switches
9	Cancel/Take
10	Hold-Nudge
11	Hold-Nudge
12	Hold-Nudge
13	HI
14	LO
15	Exchange
16	Key
17	Start
18	Enable Pins 1-8
19	Enable pins 9-17

10 Way Yellow –Meters	
Pin	Function
1	Cash In
2	Cash Out
3	Token In
4	Token Out
5	Not used
6	Not used
7	Not used
8	Not used
9	Key
10	+12v DC Common

9 Way Green - Photo	
Pin	Function
1	+5v supply
2	LED Drive
3	Signal
4	Key
5	Reel D input
6	+12v supply
7	Reel C input
8	Reel B input
9	Reel A input

15 Way Red-Power In	
Pin No	Function
1	-12v Return
2	+34v Supply
3	+34v Supply
4	Key
5	48v Return
6	-12v supply
7	+12v supply
8	+12v supply
9	+12v supply
10	+12v return
11	+12v return
12	+12v return
13	+34v return
14	+34v return
15	48v supply

19 Way Red-Stepper Motors	
Pin No	Function
1	+12v supply
2	Reel D drive
3	Reel D drive
4	Reel D drive
5	Reel D drive
6	Reel C drive
7	Reel C drive
8	Reel C drive
9	Reel C drive
10	Reel B drive
11	Reel B drive
12	Key
13	Reel B drive
14	Reel B drive
15	Reel A drive
16	Reel A drive
17	Reel A drive
18	Reel A drive
19	+12v supply